ABSTRACT OF THE DISCLOSURE

A bi-directional boost circuit for power factor correction includes a power factor control circuit and a pair of diodes, a pair of inductors, and a pair of switches. A first diode, a second diode, a first inductor, a second inductor, a first switch, and a second switch convert the AC input voltage, rectify the AC input voltage, and output an intermediate DC voltage. The power factor control circuit receives the AC input voltage and receives the intermediate DC voltage. The power factor control circuit regulates the DC output voltage. Based on the AC input voltage and the intermediate DC output voltage, the power factor control circuit controls an inductor current waveform by driving the first switch and the second switch to create a substantially sinusoidal current as seen by the power source that is in phase with the AC input voltage.